

DIATOMS—NEW GENERA AND SPECIES

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The only catalogue of diatoms which can be regarded as exhaustive, is De Toni's volume on the Bacillarieae in his *Sylloge Algarum*. This was published in 1891–1894, and contains a list of all diatoms known at that date. The price is 115 francs.

In this book diatoms are classified into Raphidieae, Pseudoraphidieae, and Crypto-raphidieae. This practically agrees with Van Heurck's arrangement, and is followed by Schuett and later writers. The book gives a latin description of the genera and species with a list of references and illustrations. Five thousand, seven hundred and forty-one species are numbered and the index, which includes synonyms, has about double that number of entries.

Several books and monographs have appeared since then, and I have myself collected references to some 1,450 new species and genera and varieties since published; so we may reckon about 7,000 species at the present date.

Various suggestions for new genera have been made during this period. Cleve in his *Naviculoid Diatoms* has revived and separated the old genera *Diploneis*, Ehr., *Pinnularia*, and *Neidium*, and has added new genera *Caloneis*, *Cymatoneis*, *Cistula*, *Pseudo-Amphiprora*, *Stenoneis*, and *Trachyneis* for various forms of *Navicula*. Of these Schuett recognizes *Cistula* and *Cymatoneis*, but regards the others as synonyms or subdivisions.

Cleve has also carved out other new genera, *Disconeis* and *Pleuroneis* out of *Cocconeis*; *Heteroneis*, *Actinoneis*, and *Microneis* out of *Achanthes*; and *Gomphoneis* out of *Gomphonema*. He would also make a new genus *Mastoneis* for *Stauroneis biformis*; *Scoliotropis* for *Scolioptleura late-striata*; and *Tropidoneis* for certain forms of *Amphiprora* and *Plagiotropis*; in this last instance he is followed by Schuett. Pantocsek's *Pseudo-Dictyoneis hungarica* appears to be a *Dictyoneis*.

Cleve further proposes to divide *Pleurosigma* by separating under *Gyrosigma* those forms in which the striae are at right angles to one another.

Mereschkowsky has proposed *Placoneis* and *Sellaphora* for certain forms of *Navicula*, basing his distinction on the form of the endochrome plates; and similarly he has made new genera *Stauronella* and *Staurophora* for *Stauroneis constricta* and *Stauroneis salina* respectively.

Other new genera are:—

ANNELLUS, Tempère. *A. Californicus*, Fossil, Sta. Monica and Sta. Maria Cal. The valve is folded on itself in the form of a tubular ring, covered with large separated granules arranged in quincunx. "Diat. du Monde Entier, p. 60."

AZPEITIA, Paragallo. *A. Temperei*, Fossil, Spain. Valve triangular, sides almost straight, angles rounded; cellular structure not reaching the edge of the valve. Cellules hexagonal, in short and decussate radiating lines, smaller at the centre and border. Margin hyaline, with a line of fine puncta divided by larger dots. *Triceratium antiquum* Pant. I. 13.115 belongs to this genus. D.M.E., p. 326, and *Diatomologia Española*, Azpeitia, p. 177, xii.2.

BACTERIOSIRA, Oestrup.

CAPSULA, Brun. *Le Diatomiste*, II., p. 235; cf. Brun and Tempère, *Diat. Japan*, 1889, p. 62; Van Heurck, *Treatise on Diat.*, p. 469. Under the name of *Capsula* Brun has separated from *Triceratium* certain exotic forms having an internal plate with a triangular space fashioned so as to recall the structure of *Entogonia*. *Triceratium acceptum*, *Hardmanianum*, *radiatum*, *trilineatum*, *exornatum*, *neglectum*, *balaniferum*, *scopus*, *Normanianum*, *Trinacria coronata*, *princeps*, *ventricosa*, *rugosa*, and *Capsula Barboi* and *Capsula biformis*, *Diat. II*, plate xx, are included in this genus.

CATENULA, Mereschkowsky. Fossil, San Pedro, Cal. Outline of valve plano-convex, girdle view as *Eunotia* or *Fragilaria*, frustules united in bands. Extremities of valve acute, terminal nodules near the margin.

CENTRONELLA, Voigt. *C. Reicheltii*, Fresh water, recent, Holstein. The valve is in the form of a three-legged star, outer extremities of the limbs capitate, inner slightly bent at the point of junction, the intermediate portion striate. In girdle view the ends are not inflated. It belongs to the Centricae. Schmidt's Atlas, 306, 32-34: Von Schönfeldt, *Diat. Germaniae*, p. 240, ix., 398; Süss. *Flora*, f. 378.

CLEVEIA, Pantocsek. *Diatomiste II*, p. 162; proposed for *Alloioneis Castracanei*.

CLEVIA, Mereschkowsky = *Pseudo-Navicula* Karsten. Mereschkowsky and Karsten unite Van Heurck's *Lyratae* and *Granulatae* of *Navicula* in this genus because of the disposition of their endochrome.

COSCINOSIRA, Gran. Arctic, marine, recent = *Coscinodiscus polychordus* Gran. Nansen's North Polar Expedition, p. 80, ii. 33. *Nord Plankton*, fasc., xix., p. 20, f. 17. A series of *Coscinodiscus lineatus* united by plasmic filaments. Peragallo, *Diat. Marines de France*, p. 427 does not consider the form or genus warranted.

CYCLOSIRA, Peragallo. Marine, recent = *Thalassiosira subtilis* Ost. A small circular diatom living in globular colonies in a gelatinous mass, attached to one another by plasmic filaments like *Cyclotella socialis*, which inhabits fresh water. *Diat. Mar. France*, cxx. 10. Peragallo in his note on page 427 admits that this is not a valid genus.

DETONULA, Schuett. Marine, recent. Sub-genus of *Lauderia*, = *Lauderia pumila*. Valves plane, with a border of spines at the edge of the disc. It is included in *Dactyliosolen* by Mann.

DIDYMOSPHENIA, Martin Schmidt. A sub-genus of *Gomphonema*, having the rhaps arcuate, and the valve bent accordingly, as in *Cymbella*. *Atl. Schmidt*, 214. 1-12. *D. sibirica*, *D. curvirostrum*, and *D. geminata* v. *stricta*, are the forms included.

DIMEROSIRA, Peragallo. Marine, recent. Sub-genus of *Dimerogramma*, with convex instead of flat valves, growing as *Dimerogramma* in banded filaments. *Diat. Mar. de France*, p. 333., lxxxii., 13, 14, 15, 19, 20.

DOSSETIA, Azpeitia. Fossil, Spain. Valves unequally convex, more or less hyaline, with a considerable laminar expansion or frill irregularly undulate. Also a hyaline frill with irregularly serrate edge surrounds the less convex valve. *Diatomologia Española*, p. 202, ix 3, 7.

FRICKEA, Heiden. Brackist, recent = *Frustulia Lewisiana*, Batavia, India, Brazil, United States, West Africa; Fossil, Japan. *Atl. Schmidt* 264.1.

GOMPHOCYMBELLA, Otto Müller. Marine, recent, California. Fossil, Fresh water, Ethiopia; Fresh water, recent, Austria. Valve as in *Cymbella*, but with one extremity smaller than the other. *Atl. Schmidt* 294. 29-32.

GOMPHOPLEURA, Reichelt = *Reicheltia* Van Heurck. *G. nobilis* *Atl. Schmidt* 215: 15, 16. Valve with one extremity smaller than the other, but cuneate also in girdle view. Fossil, Japan, Hungary, Bohemia.

GONIOCEROS, Peragallo. *G. armatum* = *Chaetoceros armatum*, West. *Diat. Mar. France*, p. 471, cxxxv. 6. *Frustule* quadrangular with the corners cut off, whence proceed long curved spines with blunt ends; there is also a smaller spine at each end of the straight sides.

HANDMANNIANA, Peragallo. *H. Austriaca*. *Mitt. Mik. Vereins Linz*, 1913, I, p. 36, taf. und fig. *Bot. Cent.*, cxxv, 1914, p. 622, no figure. Cocconeis in form with border: "die mitte von einen stark aufgetriebenen buckel (15-17 streifen) durchzogen; auch der rand zeigt feine linie mit perlen. Die unterschale zeigt mittel streifungen, welche von der schwach sichtbarn rhaphe aus alternieren."

I have been unable to find the Proceedings of the Linz Microscopical Society, which contains the figure of this species, and am unable to reconstruct it mentally from the description. Fresh water, recent. Alm See, Austria.

HERIBAUDIA, Peragallo. Fossil, Auvergne. *H. ternata*, *Diat. d'Auvergne*, p. 196, v. 25. Van Heurck, *Treatise on Diat.*, p. 542, fig. 291. Valve circular, disciform, hyaline or finely punctate, bearing

on its edge three small expansions or conical wings, between which extend three larger wings, rounded or plicate.

LICMOSPHENIA, Mereschkowsky. Marine, recent, Adriatic Villefranche, Sumatra. Frustules as in Licmophora, but with two openings in the septa instead of one opening. The superior opening is small, the inferior is larger.

OESTRUPIA, Heiden. Marine, recent = Navicula (Caloneis) Powellii with its varieties and Navicula quadriseriata Atl. Schmidt., 264. 4, 5, 8, 9. Adriatic, United States, Egypt, and Balearic Islands.

PERAGALLIA or PERAGALLOA, Schuett. Marine, recent, Baltic. It has the body of a Dactyliosolen with the horns of a Chaetoceros. *P. tropica*. The horns at the two extremities are turned in the same direction. Schuett, Bacillariales, p. 86, fig. 142: Van Heurck's Treatise on Diat., p. 419, fig. 137; Diat. Mar. France, p. 475, cxxvi., 9.

PETITIA, Peragallo. Marine, recent. Nassau, Bahamas. Valve bacillar, arcuate, covered with transverse striae interrupted by two longitudinal lines. Diat. du Monde Entier, p. 146.

PHAEODACTYLON, Bohlin. Fresh water, Finland. *P. tricornutum*. Valve a three pointed star, the arms in one plane; the outer half of the arms generally hyaline. Von Schonfeldt's Süßwasser Flora Deutschlands, etc., p. 173, fig. 379. Something like the Manx arms cut off at the knees.

PLANKTONIELLA, Schuett. Marine, recent = Coscinodiscus sol. The valve is surrounded by a broad membranous frill; in girdle view it is linear. Trans. Mic. Soc. 1860, p. 38, ii., 1, 2: Atl. Schmidt 58, 41, 42, 45: Van Heurck Syn. 129. 6: V. H. Treatise, p. 534, fig. 279: Diat. Tar. France, p. 426, cxvi. 5. Bay of Bengal, Indian Ocean, Fossil, Barbadoes.

PSEUDO-AMPHIPRORA, Cleve, Syn. Naviculoid Diat. I., p. 70 = Navicula lepidoptera, = Nav. arctica Cl. Van Heurck includes it in Orthotropis, Peragallo considers the genus good, as the structure of the frustule and the endochrome are typical. Greg. Diat. Clyde, p. 34, iv. 60.

PSEUDO-NITZSCHIA, Peragallo. For forms between *Nitzschia* and *Synedra*, includes *N. (?) seriata*, *Rhaphoneis cuneata*, and *Synedra sicula*. The power of movement indicates the presence of a rhaphe or of longitudinal openings on the keel. *Diat. Mar. France*, p. 298, lxxii, 25-29., Italy, Scotland, Arctic.

PSEUDO-PHXILLA, Forti. *Nuova Notarisia*, XX., 1909, pp. 25, 29: plate ii. Fossil, Italy; Richmond, Va., etc. Valves unequal, cylindrical, with or without spines at the end of the longer valve, smaller valve more or less convex, often included in the longer valve.

PSEUDO-STICTODISCUS, Grunow = *Stictodiscus Eulensteinii* Castr. *Challenger Diat.*, i. 7. Van Heurck and Schuett include in *Triceratium*; it resembles *Stictodiscus*, but wants the radiating folds or plicae.

RHOPALODIA, O. Müller. = *Epithemia partim*. Frustules cuneiform or sub-globular, valves keeled, without lines of junction, rhaphe and central nodule distinct, terminal nodules indistinct. Zone striate or plicate. Transverse section of valve is like a wide V with unequal arms, making the section of the frustule trapezoidal; the rhaphe occupying the acute angle is seldom visible, as the valve falls flat. *Jl. R. Mic. Soc.* 1900, p. 228: *Atlas Schmidt*, plates 253-256, 265, 294: *Diat. Mar. France*, lxxvii. *Rhopalodia* includes *Epithemia gibba* and certain forms from Nyassaland.

SCHMIDTIELLA, Ostensfeldt. *S. pelagica*. Frustules in chains, valve broadly elliptical, surface undulate, minute processes at extremities, hyaline: akin to *Grayia*. *Kohchang Flora*, 1902, p. 24, fig. 20.

SCHROEDERELLA, Peragallo. Marine, recent. = *Lauderia delicatula* Schroeder = *Detonula delicatula* Gran = *Lauderia Schroederi* Bergon = *Detonula Schroederi* Gran. Not = *Lauderia delicatula* Peragallo. *Nuova Notarisia* April, 1914, p. 131, Naples, Arcachon.

SECALLIA, Azpeitia. *Diat. Esp.*, pp. 217, 176., vi. 6, 7. Moron. *S. Caballeroi*. Valve elongato-rhomboidal with rounded angles, and with a deep depression across the shorter diameter. Granules scattered over the valve without fixed direction, but disposed in transverse lines on connecting zone, no rhaphe or nodules.

SEMSEYIA, Pantocsek. Fossil, Kertsch and Hungary. Valve arcuate, capitate, with transverse striae, marginal or complete; resembles in shape *Eunotia gracilis*. Frustule in zonal view with transverse striae interrupted by a longitudinal hyaline line inflated at the extremities. Klebschiefer von Kertsch von Dr. Jos. Pantocsek. Verhand. der Russ. Kais. Mineral Gesell. Serie 2, Band 39. 1901, 2., p. 644, taf. xii. 30, 31.

SMITHIELLA, Peragallo. *S. marina* = *Himantidium marinum* W.S. Ann. Mag. Nat. Hist. 1857, ii. 14. = *Eunotogramma debile* Grun. Van Heurck Syn. 126, 18, 19; Diat. Mar. France, p. 343. lxxxii. 36. A cymbiform *Odontidium*. Marine, recent, Biarritz.

STREPTOTHECA, Shrubsole. Leisure Hour, Nov. 1890, p. 34. J. Quekett Mic. Club, 1890, p. 259., xiii. 4-6. Peragallo, Diat. Mar. France, p. 458, cxxi., 10. Estuary of the Thames. Peragallo places it with *Rhizosolenia*, Schuett considers it "incertae sedis," Ostenfeldt and Van Heurck place it with *Eucampia*. According to Cleve *S. Tamesis* = *S. maxima* from the Indian Ocean and Malay Archipelago. It is also found in the Red Sea and North Atlantic.

SYNEDROSPHENIA, Paragallo. Diat. Mar. France, p. 312, a subgenus of *Synedra*, to include *Sceptroneis cuneata*, *Synedra clavata*, and *Synedra dubia*. Bahamas, Cayenne, Barbadoes, Samoa, Banyuls. Valve cuneate, Marine, recent and Fossil.

SZECHENYIA, Pantocsek. Hungary. Diat. Szliacs, pub. Friedlander, p. 16, ii, 58-61. Valves cylindrical, domed, hyaline; with longitudinal septa and hyaline rays; zone with transverse lines. Grows in a chain. It is like *Cladogramma* in girdle view, and is placed among the *Melosireae*.

TEMPEREA, Peragallo. *T. Mephistopheles*. Marine, recent. Tamatave, Madagascar. Diat. du Monde Entier, Nos. 98-100. Valve circular, convex, with border of radiate oval granules. Cf. *Skeletonema mediterraneum* Grun.

TEMPERELLA, Forti. *T. miocenica*. Fossil, Bergonzano, Italy. = *Aulacodiscus miocenicus* Forti, Nuova Notarisia, Jan. 1909, p. 39: April 1914, p. 109 note, vi. 1, 3, 4, 5. Valve circular, divided

into 18 or more sectors each with rows of puncta parallel to the middle row. There is a minute process near the outer margin of the valve in each alternate sector. Puncta minute, arranged in quincunx.

VALDIVIELLA, Schimper.

VANHEURCKIELLA, Pantocsek. Diat. Foss. Hung. III, 1, 4. Van Heurck Treatise on Diat., p. 540, fig. 288. Fossil, Oamaru. *V. Admirabilis* Grun. Van Heurck considers it a spongiolithum.

WEISSFLOGIA, Janisch. Gazelle Exped. i., 12-17. *W. Macdonaldii*, King George's Sound, Australia, resembles a twisted *Surirella* with short transverse markings across the spaces between the costae.

It will be noticed that many of these genera are formed for single species already described, or are very limited in extent. I have failed to find any description of *Valdiviella* or *Bacteriosira*, and doubtless this list is in other respects incomplete, but it represents a considerable amount of work in literature not easily accessible.

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